

Station List-Collecting Trip
To Washington, Oregon,
California and Baja California,
Mexico. J. Rosewater, June 1978.

JR-1-78 June 11, 1978 - 1:00 P.M.

Puget Sound
Lincoln Park
Seattle, King County
Washington

Cobble beach between Point Williams and Brace Pt.; low
tide, 0.8' at 1:16 P.M. - at Seattle - Vashon Id. ferry
terminal.

ca. 47.28 N; 122.20 W

JR-2-78 June 12, 1978 - 8:00 A.M.

Puget Sound
Port Townsend
Jefferson County
Washington

Opposite Port Townsend Motel off State Route 20;
Cobble - boulder beach; area is at mouth of Puget
Sound where it flows into Strait of Juan de Fuca water
temp. 14°C, Salinity 27‰.

48.07 N; 122.46 W

JR-3-78 June 12, 1978 - 12:30 P.M.

Strait of Juan de Fuca
Sekiu
Clallam County
Washington

low tide 11:15 A.M. Water temp. 18°C, Salinity 28‰,
Littorina from rocky breakwater - on rocks and seaweed.

48.16 N; 124.18 W

JR-4-78 June 12, 1978 - 1:30 P.M.

Strait of Juan de Fuca
about 4-5 miles west of Sekiu
Clallam County, Washington
rising tide, rocky beach
ca. 48.16 N; 124.19 W

JR-5-78 June 12, 1978 - 2:45 P.M.

Strait of Juan^de Fuca
Neah Bay
Clallam County
Washington

rocky shore, west side of bay, Fucus; water temperature
18°C, salinity 26%.
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.

Mouth of Grays Harbor
Point Chehalis
Westport
Grays Harbor County
Washington

rocky revetment and groin, south entrance to Grays Harbor;
low tide at 12:00 Noon
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.

south side Grays Harbor, 1/4 mile west of Elk River
Bridge on state route 105
south of Westport
Grays Harbor County
Washington

Salt/Salicornia Marsh; few Alexia at bases of plants in
mud, no littorina, water temperature 20°C, salinity 16%.
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.

mouth of Elk River, south of bridge over state route 105
Grays Harbor, south of Westport
Grays Harbor County
Washington

edge of tidal river channel; Salicornia marsh with Fucus
at margin near channel. Littorina and eggs from on and
under Fucus and on mud beneath. Salinity 16%.
ca 46.48 N; 124.03 W

JR-9-78 June 13, 1978 - 4:00-4:30 P.M.

Willapa Bay, off State Route 101
about 6 miles N.E. of Ilwaco
Pacific County
Washington

stony beach margin of bay Littorina and eggs associated
with Fucus
ca 46.19 N; 124.03 W

JR-10-78 June 14, 1978 - 9:00 A.M.

Pacific Ocean
Cape Meares
Tillamook County
Oregon

outer coast, high energy beach, large cobbles; no
Littorina seen; goose barnacles, Physalia stranded on beach.
ca 45°.29 N; 123°.59 W.

JR-11-78 June 14, 1978 - 9:45 A.M.

Tillamook Bay (outer-west-side)
west of Bay City and between Tillamook and Cape Meares
Tillamook County
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base
of jetty and near mouth of Tillamook River
no Littorina, Salinity 1‰
ca 45.30 N; 123.53 W

JR-12-78 June 14, 1978 - 10:15 A.M.

Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon

about 1/4 mile out on jetty from stall.; rocks, boulders
with Fucus - low salinity Littorina and eggs, few Mytilus,
isopods, dead Mya. Salinity 0‰
45°.30 N; 123°.53 W

JR-13-78 June 14, 1978 - 12:00 Noon

Netarts Bay
Netarts
Tillamook County
Oregon

just south of City; rocky fill on shore side (inside)
of bay. Littorina scutulata on and under rocks; water
temperature 15°C; salinity 15‰
45.26 N; 123.57 W

JR-14-78 June 14, 1978 - 2:15 P.M.

Siletz Bay
just South of Lincoln City
Lincoln County
Oregon

near mouth of Siletz Bay on rocky promontory just South
of river; low tide ~~and~~ (low tide was about 1:00 P.M.)
L. sitchana and low salinity form, L. scutulata, banded form
from on and under rocks
44.59 N; 123.59 W

JR-15-78 June 15, 1978 - 9:30 A.M. - 10:30 A.M.

Pacific Ocean
Sunset Bay State Park
South west of Charleston, ca. 2 miles
Coos County
Oregon

Littorina scutulata from rocks from mid-tide line to
6-8 feet above High tide line; larger specimens higher on
shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs
etc. in pools; salinity 25‰ (L. sitchana and L. planaxis not
seen although were reported by S. Behrens to have distributional
end points here).
ca. 43°.20; 124.18 W

JR-16-78 June 15, 1978 - 11:30-12:15 P.M.

Pacific Ocean
South cove, Cape Arago State Park
ca. 5 miles southwest of Charleston
Coos County
Oregon

Littorina scutulata from rocks, abundant stranded Physalia
low tide ca. 12:30 P.M.
ca. 43°.20 N, 124.18 W

JR-17-78 June 15, 1978 - 2:30 P.M.

Pacific Ocean at Mouth of Coquille River, north jetty
Bandon
Coos County
Oregon

Littorina scutulata, Thais on rocks
43.07 N; 124.25 W

JR-18-78 June 15, 1978

Pacific Ocean
1-2 miles south of Port Orford
Curry County
Oregon

Littorina scutulata only on rocks; salinity 33%
42.45 N; 124.30 W

JR-19-78 June 15, 1978

Pacific Ocean
near Lighthouse Point, Crescent City
Del Norte County
California

Littorina scutulata from rocks on rising tide Salinity 33%
41.45 N; 124.12 W

JR-20-78 June 16, 1978 - 9:15 A.M.

Pacific Ocean
near Lagoon Creek, ca 15 miles South of Crescent City on
US Route 101
Del Norte County
California

Littorina scutulata, only, on rocks
ca. 41°.35 N; 124°.10 W

JR-21-78 June 16, 1978 - 10:30 A.M.

Pacific Ocean
1 mile southwest of Orick
Humboldt County
California

Littorina scutulata only on large rocks at south end of
beach; on ocean side of US route 101 across road from
freshwater lagoon.
41.17 N; 124.04 W

JR-22-78 June 16, 1978 - 11:45 A.M.

Pacific Ocean
Trinidad State Park, Trinidad
Humboldt County
California

Ocean beach; Littorina scutulata from rocks covered with seaweed.

ca. 41°10 N; 124.08 W

JR-23-78 June 16, 1978 - 12:15 P.M.

Bay side of point
Trinidad State Park, Trinidad
Humboldt County
California

Littorina scutulata from rocks
ca. 41°.10 N; 124.08 W

JR-24-78 June 16, 1978 - 2:45-4:15 P.M.

West side Humboldt Bay
about 1 mile north of Samoa
Humboldt County, California

along Salicornia marsh fringe and mud interface;
Littorina newcombiana, alexia some L. scutulata at base
of plants and under Fucus - Salinity 25‰ on damp mud.
ca. 40.47 N; 124.11 W

JR-25-78 June 17, 1978

Pacific Ocean
about 4 miles, North at Bodega Bay on State Route 1
Sonoma County
California

Littorina scutulata only on rocks
ca. 38°.15 N; 123.05 W.

JR-26-78 June 17, 1978

Pacific Ocean
about 15 miles north of Sausalito and south east of
Bolinas, on inlet along State Route 1
Marin County
California

Littorina scutulata only on and under small stones and cobbles.
ca. 37.54 N; 122.42 W

- JR-27-78 June 18, 1978 10:30 A.M.
West side San Francisco Bay
along U.S. Route 101, about 1 mile North of Oyster
Point and ca 2 miles south San Francisco city line.
San Mateo County
California

falling tide; Littorina scutulata on and under rocks
along water line; salinity 25%
ca 37.41 N; 122.24 W
- JR-28-78 June 18, 1978 - 5:00 P.M.
Mouth of San Francisco Bay
Fort Point, at south end Golden Gate Bridge, San Francisco
San Francisco County, California

high energy beach; Littorina scutulata from rocks,
sparse; salinity 30%
37.48 N; 122.28 W
- JR-29-78 June 19, 1978 - 8:30 A.M.
San Francisco Bay, under Bay Bridge
West side Treasure Island,
San Francisco County
California

on algae covered rocks: L. scutulata, Thais sp.; high energy
coast; mid tide, rising; on Naval Base
37.50 N; 122.22 W
- JR-30-78 June 19, 1978 9:00 A.M.,
San Francisco Bay, under Bay Bridge
East Side Treasure Island
San Francisco County
California

algae covered rocks (Fucus +) and under rocks; protected
side of island; Littorina scutulata under rocks and on
Fucus
37.50 N; 122.22 W
- JR-31-78 June 19, 1978 - 12:00 Noon
Monterey Bay
rock jetty, south entrance harbor
Moss Landing
Monterey County
California

Littorina planaxis, First seen here, on damp.
boulders at top of tide line in spray zone;
tide falling, low at 2:30 P.M.
salinity 36 ‰
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.

Pacific Ocean
Asilomar State Beach
West at Pacific Grove
Monterey County
California

Littorina scutulata from mid to upper tide level;
Littorina planaxis in upper tide level to Spray zone
above high tide line--on granitic multitextured rock--animals
showing color and marking variations adaptive to substrate
ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.

(1-3)

Pacific Ocean
on rock jetty just south of Morro Rock
Morro Bay
San Luis Obispo County
California

substation 1: - from beach side of jetty, mid and high tidal levels
" 2: - from top and outside of jetty in ocean spray zone
" 3: - from low tide line on rocks where very young, probably
recently meta morphosed Littorina (2 species) living.
about low tide - 35.22 N; 120.51 W

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.

Pacific Ocean
Shell Beach, south part of town
San Luis Obispo County
California

Littorina scutulata and L. planaxis on rocks rising tide -
35.09 N; 120.40 W

JR-35-78 June 21, 1978 - 10:00 A.M.

Pacific Ocean
El Capitan Beach State Park
ca 15 miles west of Santa Barbara
Santa Barbara County
California

on rocks in spray and upper intertidal zone; nearly
high tide; Salinity 31‰
37.43 N; 119.38 W

JR-36-78 June 21, 1978 - 12:00 Noon

Pacific Ocean
South end of State Beach, Carpinteria
Santa Barbara County
California

Littorina scutulata and L. planaxis from rocky outcrop,
falling tide
34.24 N; 119.31 W

JR-37-78 June 22, 1978 - 12:00 Noon

Pacific Ocean
South of State Beach, jetty at entrance to lagoon, Carlsbad,
San Diego County
California
33.10 N; 117.21 W

JR-38-78 June 22, 1978 2:30 - 3:30 P.M.

Pacific Ocean
Ocean side, tide pool area,
Point Loma, San Diego County
California

Littorina scutulata and L. planaxis in spray zone; some
L. planaxis ca 30 feet above water on vertical cliff face,
in spray zone and in pock holes in rock
32.41 N; 117.14 W

JR-39-78 June 24, 1978 - 7:00 P.M.

Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

Route Mex 11., on shore rocks just above water Littorina
penicillata and Nerita
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P. M.

Bahia De La Paz (south side)
about 8 miles west of La Paz
El Centenario
Baja California Sur
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate
shore, low tide, dead shells only, no Littorina.
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 NOON - 1:30 P.M.

Pacific Ocean
Punto Lobos Beach, about 2.5 miles south of Todos Santos,
beyond ^{end} ~~each~~ of paved road Mex. 9.
Baja California Sur
Mexico

Littorina modesta, pullata, penicillata, and aspera in
crevices of rocky promontory at south end of beach
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978

Pacific Ocean
San Pedrito, ca 4.3 miles south of Todos Santos, beyond
end of paved road, Mex. 9.
Baja California Sur
Mexico

4 species of Littorinidae, as in JR-41-78, actively crawling
in surf; rocky headland at south end of beach; nearly high
tide-Salinity 34‰ in open surf; 12‰ in hypo saline lagoon
behind beach
ca 23.27 N; 110.13 W

JR-43-78 June 27, 1978

Bahia de Palmas, Gulf of California
Los Barriles
Baja California Sur
Mexico

large boulders scattered on sandy beach, Littorina
penicillata on sunny side of rocks; Siphonaria with
spiral egg masses on wave-splashed rocks-egg masses
about 1" across (Kodachromes taken).
23.39 N; 109.42 W

JR-44-78 June 27, 1978 - 11:45 A.M.

Bahia San Lucas
Cabo San Lucas
Baja California Sur
Mexico

on jetty near ferry landing and next to canning factory.
4 species of Littorina on rocks and in cracks of rocks;
L. pullata in wetter situations
22.53 N; 109.54 W

JR-45-78 June 27, 1978 1:00 - 2:00 P.M.

Pacific Ocean, public beach between Cabo San Lucas
and San Jose Del Cabo
Baja California del Sur
Mexico

4 species of Littorina on rocks
ca 22.53 N; 109.54 W

JR-46-78 June 29, 1978 - 8:30 - 10:00 A.M.

Bahia De La Paz
Public Beach north of Pichilingue
about 11 miles North of La Paz
Baja California del Sur
Mexico

Littorina penicillata, Littorina sp., and various
other mollusks from rocks on, under and in cracks)
along rocky headland north of beach; many Nerita eggs.
Few mangroves with few L. penicillata at base of trunk.
Salinity 32-33%.
24.15 N; 110.20 W

JR-47-78 June 29, 1978 - 11:00 A.M.

Bahia De La Paz
about 2 miles south of Pichilingue
Baja California Sur
Mexico

sheltered bay with mangrove fringe;
Littorina penicillata rare on rocks
salinity 35%.
ca 24.15 N; 110.20 W

JR-48-78 June 29, 1978 - 12:00 Noon

Same locality as JR-39-78
24.10 N; 110.18 W

JR-49-78 June 29, 1978

south side Bahia De La Paz
ferry dock, end Sinaloa St.
La Paz
Baja California ~~Del~~ Sur
Mexico

Pecten Shells from fishery; Salinity 33%.
ca 24.10 N; 110.18 W

Station List-Collecting Trip
To Washington, Oregon,
California and Baja California,
Mexico. J. Rosewater, June 1978.

JR-1-78 June 11, 1978 - 1:00 P.M.

Puget Sound
Lincoln Park
Seattle, King County
Washington

use "CO"

L. sitkana 796844 (A)

L. scutulata 796845 (A)

Cobble beach between Point Williams and Brace Pt.; low
tide, 0.8' at 1:16 P.M. - at Seattle - Vashon Id. ferry
terminal.
ca. 47.28 N; 122.20 W

JR-2-78 June 12, 1978 - 8:00 A.M.

Puget Sound
Port Townsend
Jefferson County
Washington

L. scutulata 796846 (A)

L. sitkana 796847 (A)

Opposite Port Townsend Motel off State Route 20;
Cobble - boulder beach; area is at mouth of Puget
Sound where it flows into Strait of Juan de Fuca water
temp. 14°C, Salinity 27%.
48.07 N; 122.46 W

JR-3-78 June 12, 1978 - 12:30 P.M.

Strait of Juan de Fuca
Sekiu
Clallam County
Washington

L. sitkana 796848 (A)

L. scutulata 796849 (A)

low tide 11:15 A.M. Water temp. 18°C, Salinity 28%,
Littorina from rocky breakwater - on rocks and seaweed.
48.16 N; 124.18 W

JR-4-78 June 12, 1978 - 1:30 P.M.

Strait of Juan de Fuca
about 4-5 miles west of Sekiu
Clallam County, Washington
rising tide, rocky beach
ca. 48.16 N; 124.19 W

L. scutulata 796850 (A)

L. sitkana 796851 (A)

JR-5-78 June 12, 1978 - 2:45 P.M.

Strait of Juan de Fuca
Neah Bay
Clallam County
Washington

L. sitkana 794216 (A, D)
L. scutellata 794217 (A)

rocky shore, west side of bay, Fucus; water temperature
18°C, salinity 26‰
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.

Mouth of Grays Harbor
Point Chehalis
Westport
Grays Harbor County
Washington

L. scutellata 794218 (A)

rocky revetment and groin, south entrance to Grays Harbor;
low tide at 12:00 Noon
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.

south side Grays Harbor, 1/4 mile west of Elk River
Bridge on state route 105
south of Westport
Grays Harbor County
Washington

Salt/Salicornia Marsh; few Alexia at bases of plants in
mud, no Littorina, water temperature 20°C, salinity 16‰
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.

mouth of Elk River, south of bridge over state route 105
* Grays Harbor, south of Westport
Grays Harbor County
Washington

L. newcombiana - *Sitkana* 794219 (A)

edge of tidal river channel; Salicornia marsh with Fucus
at margin near channel. Littorina and eggs from on and
under Fucus and on mud beneath. Salinity 16‰
ca 46.48 N; 124.03 W

JR-9-78 June 13, 1978 - 4:00-4:30 P.M.

Willapa Bay, off State Route 101
about 6 miles N.E. of Ilwaco
Pacific County
Washington

L. newcombiana [Sithkana] (A)

784220

stony beach margin of bay Littorina and eggs associated
with Fucus
ca 46.19 N; 124.03 W

JR-10-78 June 14, 1978 - 9:00 A.M.

Pacific Ocean
Cape Meares
Tillamook County
Oregon

outer coast, high energy beach, large cobbles; no
Littorina seen; goose barnacles, Physalia stranded on beach.
ca 45°.29 N; 123°.59 W.

JR-11-78 June 14, 1978 - 9:45 A.M.

Tillamook Bay (outer-west-side)
west of Bay City and between Tillamook and Cape Meares
Tillamook County
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base
of jetty and near mouth of Tillamook River
no Littorina, Salinity 1‰
ca 45.30 N; 123.53 W

JR-12-78 June 14, 1978 - 10:15 A.M.

Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon

L. sitchana (2)

about 1/4 mile out on jetty from stall.; rocks, boulders
with Fucus - low salinity Littorina and eggs, few Mytilus,
isopods, dead Mya. Salinity 0‰
45°.30 N; 123°.53 W

✓ JR-13-78 June 14, 1978 - 12:00 Noon

Netarts Bay
Netarts
Tillamook County
Oregon

L. scutulata 794222 (A)

just south of City; rocky fill on shore side (inside)
of bay. Littorina scutulata on and under rocks; water
temperature 15°C; salinity 15‰
45.26 N; 123.57 W

✓ JR-14-78 June 14, 1978 - 2:15 P.M.

Siletz Bay
just South of Lincoln City
Lincoln County
Oregon

L. s. Fkana 794223 (A)
L. scutulata 794224 (A)

near mouth of Siletz Bay on rocky promontory just South
of river; low tide^{and} (low tide was about 1:00 P.M.)
L. sitchana and low salinity form, L. scutulata, banded form
from on and under rocks
44.59 N; 123.59 W

✓ JR-15-78 June 15, 1978 - 9:30 A.M. - 10:30 A.M.

Pacific Ocean
Sunset Bay State Park
South west of Charleston, ca. 2 miles
Coos County
Oregon

L. scutulata 794225 (A)

Littorina scutulata from rocks from mid-tide line to
6-8 feet above High tide line; larger specimens higher on
shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs
etc. in pools; salinity 25‰ (L. sitchana and L. planaxis not
seen although were reported by S. Behrens to have distributional
end points here).
ca. 43°.20; 124.18 W

✓ JR-16-78 June 15, 1978 - 11:30-12:15 P.M.

Pacific Ocean
South cove, Cape Arago State Park
ca. 5 miles southwest of Charleston
Coos County
Oregon

L. scutulata 794226 (A)

Littorina scutulata from rocks, abundant stranded Physalia
low tide ca. 12:30 P.M.
ca. 43°.20 N, 124.18 W

JR-17-78 June 15, 1978 - 2:30 P.M.

Pacific Ocean at Mouth of Coquille River, north jetty

Bandon

Coos County

Oregon

L. scutulata 794227 (A)

Littorina scutulata, Thais on rocks

43.07 N; 124.25 W

JR-18-78 June 15, 1978

Pacific Ocean

1-2 miles south of Port Orford

Curry County

Oregon

L. scutulata 794228 (A)

Littorina scutulata only on rocks; salinity 33%

42.45 N; 124.30 W

JR-19-78 June 15, 1978

Pacific Ocean

near Lighthouse Point, Crescent City

Del Norte County

California

L. scutulata 794229 (A)

Littorina scutulata from rocks on rising tide Salinity 33%

41.45 N; 124.12 W

JR-20-78 June 16, 1978 - 9:15 A.M.

Pacific Ocean

near Lagoon Creek, ca 15 miles South of Crescent City on

US Route 101

Del Norte County

California

L. scutulata 794230

Littorina scutulata, only, on rocks

ca. 41.35 N; 124.10 W

JR-21-78 June 16, 1978 - 10:30 A.M.

Pacific Ocean

1 mile southwest of Orick

Humboldt County

California

L. scutulata 794231

Littorina scutulata only on large rocks at south end of beach; on ocean side of US route 101 across road from freshwater lagoon.

41.17 N; 124.04 W

JR-22-78 June 16, 1978 - 11:45 A.M.

Pacific Ocean
Trinidad State Park, Trinidad
Humboldt County
California

L. scutulata 794232 (A)

Ocean beach; Littorina scutulata from rocks covered with seaweed.
ca. 41°10 N; 124.08 W

JR-23-78 June 16, 1978 - 12:15 P.M.

Bay side of point
Trinidad State Park, Trinidad
Humboldt County
California

L. scutulata 794233 (A)

Littorina scutulata from rocks
ca. 41°10 N; 124.08 W

JR-24-78 June 16, 1978 - 2:45-4:15 P.M.

West side Humboldt Bay
about 1 mile north of Samoa
Humboldt County, California

L. newcombiana 794251 (A)
L. scutulata (D)
766363

along Salicornia marsh fringe and mud interface;
Littorina newcombiana, alexia some L. scutulata at base
of plants and under Fucus; - Salinity 25‰ on damp mud.
ca. 40.47 N; 124.11 W

JR-25-78 June 17, 1978

Pacific Ocean
about 4 miles, North of Bodega Bay on State Route 1
Sonoma County
California

L. scutulata 794252 (A)

Littorina scutulata only on rocks
ca. 38°15 N; 123.05 W.

JR-26-78 June 17, 1978

Pacific Ocean
about 15 miles north of Sausalito and south east of
Bolinas, on inlet along State Route 1
Marin County
California

L. scutulata 794253 (A)

Littorina scutulata only on and under small stones and cobbles.
ca. 37.54 N; 122.42 W

- α JR-27-78 June 18, 1978 10:30 A.M.
West side San Francisco Bay
along U.S. Route 101, about 1 mile North of Oyster
Point and ca 2 miles south San Francisco city line.
San Mateo County
California *L. scutulata* 794254 (A)
falling tide; Littorina scutulata on and under rocks
along water line; salinity 25‰
ca 37.41 N; 122.24 W
- 2 JR-28-78 June 18, 1978 - 5:00 P.M.
Mouth of San Francisco Bay
Fort Point, at south end Golden Gate Bridge, San Francisco
San Francisco County, California *L. scutulata* 794255 (A)
high energy beach; Littorina scutulata from rocks,
sparse; salinity 30‰
37.48 N; 122.28 W
- 3 JR-29-78 June 19, 1978 - 8:30 A.M.
San Francisco Bay, under Bay Bridge
West side Treasure Island,
San Francisco County
California *L. scutulata* 794256 (A)
on algae covered rocks: L. scutulata, Thais sp.; high energy
coast; mid tide, rising; on Naval Base
37.50 N; 122.22 W
- α JR-30-78 June 19, 1978 9:00 A.M.
San Francisco Bay, under Bay Bridge
East Side Treasure Island
San Francisco County
California *L. scutulata* 794257 (A)
algae covered rocks (Fucus +) and under rocks; protected
side of island; Littorina scutulata under rocks and on
Fucus
37.50 N; 122.22 W
- α α JR-31-78 June 19, 1978 - 12:00 Noon
Monterey Bay
rock jetty, south entrance harbor
Moss Landing
Monterey County
California *L. scutulata* 794258 (A) 2
L. keenae 794259 (A) 3
(over)

Littorina planaxis, First seen here, on damp.
boulders at top of tide line in spray zone;
tide falling, low at 2:30 P.M.
salinity 36 ‰
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.

Pacific Ocean
Asilomar State Beach
West ~~at~~ Pacific Grove
Monterey County
California

L. scutulata (A) 794260
L. keenae (A) 794359

Littorina scutulata from mid to upper tide level;
Littorina planaxis in upper tide level to Spray zone
above high tide line--on granitic multitextured rock--animals
showing color and marking variations adaptive to substrate
ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.
(1-3)

Pacific Ocean
on rock jetty just south of Morro Rock
Morro Bay
San Luis Obispo County
California

L. keenae (sub-1) 794261 (A)
L. scutulata (sub-1) 794262 (A)
L. keenae (sub-2) 794263 (A)

substation 1: - from beach side of jetty, mid and high tidal levels
" 2: - from top and outside of jetty in ocean spray zone
" 3: - from low tide line on rocks where very young, probably
recently metamorphosed Littorina (2 species) living.
about low tide - 35.22 N; 120.51 W

L. scutulata (sub-2) 794264 (A)
L. keenae (sub-3) 794265 (A)
L. scutulata (sub-3) 794266 (A)

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.

Pacific Ocean
Shell Beach, south ^{of} (part of town)
San Luis Obispo County
California

L. scutulata 794267 (A)
L. keenae 794268 (A)

Littorina scutulata and L. planaxis on rocks rising tide -
35.09 N; 120.40 W

JR-35-78 June 21, 1978 - 10:00 A.M.

Pacific Ocean
El Capitan Beach State Park
ca 15 miles west of Santa Barbara
Santa Barbara County
California

L. scutulata (A) 794269
L. keenae (A) 794270

on rocks in spray and upper intertidal zone; nearly
high tide; Salinity 31%.
37.43 N; 119.38 W

JR-36-78 June 21, 1978 - 12:00 Noon

Pacific Ocean
South end of State Beach, Carpinteria
Santa Barbara County
California

L. scutulata (A) 794211
L. keenae (A) 794272

Littorina scutulata and L. planaxis from rocky outcrop,
falling tide
34.24 N; 119.31 W

JR-37-78 June 22, 1978 - 12:00 Noon

Pacific Ocean
South of State Beach, jetty at entrance to lagoon, Carlsbad,
San Diego County
California
33.10 N; 117.21 W

L. keenae (A) 794273
L. scutulata (A) 794274

JR-38-78 June 22, 1978 2:30 - 3:30 P.M.

Pacific Ocean
Ocean side, tide pool area,
Point Loma, San Diego County
California

L. scutulata (A) 794279
L. keenae (A) 794299

Littorina scutulata and L. planaxis in spray zone; some
L. planaxis ca 30 feet above water on vertical cliff face,
in spray zone and in pock holes in rock
32.41 N; 117.14 W

JR-39-78 June 24, 1978 - 7:00 P.M.

Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

L. penicillata (A) 794300

Route Mex 11., on shore rocks just above water Littorina
penicillata and Nerita
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P. M.

Bahia De La Paz (south side)
about 8 miles west of La Paz
El Centenario
Baja California Sur
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate
shore, low tide, dead shells only, no Littorina.
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 Noon - 1:30 P.M.

Pacific Ocean
Punto Lobos Beach, about 2.5 miles south of Todos Santos,
beyond ^{end} ~~each~~ of paved road Mex. 9.
Baja California Sur
Mexico

L. modesta (A) 794301

L. aspera (A) 794302

L. penicillata (A) 794303

L. pullata (A) 794304

SR
41

Littorina modesta, pullata, penicillata, and aspera in
crevices of rocky promontory at south end of beach
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978

Pacific Ocean
San Pedrito, ca 4.3 miles south of Todos Santos, beyond
end of paved road, Mex. 9.
Baja California Sur
Mexico

L. aspera (A) 794304

L. penicillata (A) 794305

L. modesta (A) 794306

L. pullata (A) 794307

JR-42

4 species of Littorinidae, as in JR-41-78, actively crawling
in surf; rocky headland at south end of beach; nearly high
tide-Salinity 34% in open surf; 12% in hypo saline lagoon
behind beach
ca 23.27 N; 110.13 W

JR-43-78 June 27, 1978

Bahia de Palmas, Gulf of California
Los Barriles
Baja California Sur
Mexico

L. penicillata (A) 794308

large boulders scattered on sandy beach, Littorina
penicillata on sunny side of rocks; Siphonaria with
spiral egg masses on wave-splashed rocks-egg masses
about 1" across (Kodachromes taken).
23.39 N; 109.42 W

JR-44-78 June 27, 1978 - 11:45 A.M.

Bahia San Lucas
Cabo San Lucas
Baja California Sur
Mexico

L. pullata (A) 796841
L. aspera (A) 796809
L. atrata (A) 794310
L. modesta (A) 794311
L. penicillata (A) 794312

on jetty near ferry landing and next to canning factory.
4 species of Littorina on rocks and in cracks of rocks;
L. pullata in wetter situations
22.53 N; 109.54 W

JR-45-78 June 27, 1978 1:00-2:00 P.M.

Pacific Ocean, public beach between Cabo San Lucas
and San Jose Del Cabo
Baja California del Sur
Mexico

L. modesta (A) 796843

L. aspera (A) 796842

L. pullata (A) 794313
L. penicillata (A) 794314

break here
"over" &
put next
line on
back

4 species of Littorina on rocks
ca 22.53 N; 109.54 W

JR-46-78 June 29, 1978 - 8:30 - 10:00 A.M.

Bahia De La Paz
Public Beach north of Pichilingue
about 11 miles North of La Paz
Baja California del Sur
Mexico

L. penicillata (A) 794388
L. albicarinata (A) 794389

Littorina penicillata, Littorina sp., and various
other mollusks from rocks on, under and in cracks)
along rocky headland north of beach; many Nerita eggs.
Few mangroves with few L. penicillata at base of trunk.
Salinity 32-33%.
24.15 N; 110.20 W

JR-47-78 June 29, 1978 - 11:00 A.M.

L. penicillata (A) 794390

Bahia De La Paz
about 2 miles south of Pichilingue
Baja California Sur
Mexico

sheltered bay with mangrove fringe;
Littorina penicillata rare on rocks
salinity 35%.
ca 24.15 N; 110.20 W

JR-48-78 June 29, 1978 - 12:00 Noon

L. albicarinata (A) 794391
L. penicillata (A) 794392

Same locality as JR-39-78
24.10 N; 110.18 W

JR-49-78 June 29, 1978

south side Bahia De La Paz
ferry dock, end Sinaloa St.
La Paz
Baja California Sur
Mexico

Pecten Shells from fishery; Salinity 33%.
ca 24.10 N; 110.18 W

Station List-Collecting Trip
To Washington, Oregon,
California and Baja California,
Mexico. J. Rosewater, June 1978.

JR-1-78 June 11, 1978 - 1:00 P.M.

Puget Sound
Lincoln Park
Seattle, King County
Washington

Cobble beach between Point Williams and Brace Pt.; low
tide, 0.8' at 1:16 P.M. - at Seattle - Vashon Id. ferry
terminal.
ca. 47.28 N; 122.20 W

JR-2-78 June 12, 1978 - 8:00 A.M.

Puget Sound
Port Townsend
Jefferson County
Washington

Opposite Port Townsend Motel off State Route 20;
Cobble - boulder beach; area is at mouth of Puget
Sound where it flows into Strait of Juan de Fuca water
temp. 14°C, Salinity 27%.
48.07 N; 122.46 W

JR-3-78 June 12, 1978 - 12:30 P.M.

Strait of Juan de Fuca
Sekiu
Clallam County
Washington

low tide 11:15 A.M. Water temp. 18°C, Salinity 28‰
Littorina from rocky breakwater - on rocks and seaweed.
48.16 N; 124.18 W

JR-4-78 June 12, 1978 - 1:30 P.M.

Strait of Juan de Fuca
about 4-5 miles west of Sekiu
Clallam County, Washington
rising tide, rocky beach
ca. 48.16 N; 124.19 W

JR-5-78 June 12, 1978 - 2:45 P.M.

Strait of Juan de Fuca
Neah Bay
Clallam County
Washington

rocky shore, west side of bay, Fucus; water temperature
18°C, salinity 26‰
48.22 N; 124.37 W

JR-6-78 June 13, 1978 - 10:30 A.M.

Mouth of Grays Harbor
Point Chehalis
Westport
Grays Harbor County
Washington

rocky revetment and groin, south entrance to Grays Harbor;
low tide at 12:00 Noon
ca 46.53 N; 124.06 W

JR-7-78 June 13, 1978 - 12:00 Noon - 12:30 P.M.

south side Grays Harbor, 1/4 mile west of Elk River
Bridge on state route 105
south of Westport
Grays Harbor County
Washington

Salt/Salicornia Marsh; few Alexia at bases of plants in
mud, no Littorina, water temperature 20°C, salinity 16‰
ca 46.48 N; 124.03 W

JR-8-78 June 13, 1978 - 12:30 P.M. - 1:30 P.M.

mouth of Elk River, south of bridge over state route 105
Grays Harbor, south of Westport
Grays Harbor County
Washington

edge of tidal river channel; Salicornia marsh with Fucus
at margin near channel. Littorina and eggs from on and
under Fucus and on mud beneath. Salinity 16‰
ca 46.48 N; 124.03 W

JR-9-78 June 13, 1978 - 4:00-4:30 P.M.

Willapa Bay, off State Route 101
about 6 miles N.E. of Ilwaco
Pacific County
Washington

stony beach margin of bay Littorina and eggs associated
with Fucus
ca 46.19 N; 124.03 W

JR-10-78 June 14, 1978 - 9:00 A.M.

Pacific Ocean
Cape Meares
Tillamook County
Oregon

outer coast, high energy beach, large cobbles; no
Littorina seen; goose barnacles, Physalia stranded on beach.
ca 45°.29 N; 123°.59 W.

JR-11-78 June 14, 1978 - 9:45 A.M.

Tillamook Bay (outer-west-side)
west of Bay City and between Tillamook and Cape Meares
Tillamook County
Oregon

rocks, muddy shore with Fucus patches and Salicornia, at base
of jetty and near mouth of Tillamook River
no Littorina, Salinity 1‰
ca 45.30 N; 123.53 W

JR-12-78 June 14, 1978 - 10:15 A.M.

Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon

about 1/4 mile out on jetty from stall.; rocks, boulders
with Fucus - low salinity Littorina and eggs, few Mytilus,
isopods, dead Mya. Salinity 0‰
45°.30 N; 123°.53 W

JR-13-78 June 14, 1978 - 12:00 Noon

Netarts Bay
Netarts
Tillamook County
Oregon

just south of City; rocky fill on shore side (inside)
of bay. Littorina scutulata on and under rocks; water
temperature 15°C; salinity 15‰.
45.26 N; 123.57 W

JR-14-78 June 14, 1978 - 2:15 P.M.

Siletz Bay
just South of Lincoln City
Lincoln County
Oregon

near mouth of Siletz Bay on rocky promontory just South
of river; low tide ~~and~~ (low tide was about 1:00 P.M.)
L. sitchana and low salinity form, L. scutulata, banded form
from on and under rocks
44.59 N; 123.59 W

JR-15-78 June 15, 1978 - 9:30 A.M. - 10:30 A.M.

Pacific Ocean
Sunset Bay State Park
South west of Charleston, ca. 2 miles
Coos County
Oregon

Littorina scutulata from rocks from mid-tide line to
6-8 feet above High tide line; larger specimens higher on
shore; Fucus and Ulva; Tegula "Murex", Anemones, crabs
etc. in pools; salinity 25‰ (L. sitchana and L. planaxis not
seen although were reported by S. Behrens to have distributional
end points here).
ca. 43°.20; 124.18 W

JR-16-78 June 15, 1978 - 11:30-12:15 P.M.

Pacific Ocean
South cove, Cape Arago State Park
ca. 5 miles southwest of Charleston
Coos County
Oregon

Littorina scutulata from rocks, abundant stranded Physalia
low tide ca. 12:30 P.M.
ca. 43°.20 N, 124.18 W

JR-17-78 June 15, 1978 - 2:30 P.M.

Pacific Ocean at Mouth of Coquille River, north jetty
Bandon
Coos County
Oregon

Littorina scutulata, Thais on rocks
43.07 N; 124.25 W

JR-18-78 June 15, 1978

Pacific Ocean
1-2 miles south of Port Orford
Curry County
Oregon

Littorina scutulata only on rocks; salinity 33%
42.45 N; 124.30 W

JR-19-78 June 15, 1978

Pacific Ocean
near Lighthouse Point, Crescent City
Del Norte County
California

Littorina scutulata from rocks on rising tide Salinity 33%
41.45 N; 124.12 W

JR-20-78 June 16, 1978 - 9:15 A.M.

Pacific Ocean
near Lagoon Creek, ca 15 miles South of Crescent City on
US Route 101
Del Norte County
California

Littorina scutulata, only, on rocks
ca. 41°.35 N; 124°.10 W

JR-21-78 June 16, 1978 - 10:30 A.M.

Pacific Ocean
1 mile southwest of Orick
Humboldt County
California

Littorina scutulata only on large rocks at south end of
beach; on ocean side of US route 101 across road from
freshwater lagoon.
41.17 N; 124.04 W

JR-22-78 June 16, 1978 - 11:45 A.M.

Pacific Ocean
Trinidad State Park, Trinidad
Humboldt County
California

Ocean beach; Littorina scutulata from rocks covered with seaweed.

ca. 41°10 N; 124.08 W

JR-23-78 June 16, 1978 - 12:15 P.M.

Bay side of point
Trinidad State Park, Trinidad
Humboldt County
California

Littorina scutulata from rocks

ca. 41°10 N; 124.08 W

JR-24-78 June 16, 1978 - 2:45-4:15 P.M.

West side Humboldt Bay
about 1 mile north of Samoa
Humboldt County, California

along Salicornia marsh fringe and mud interface;
Littorina newcombiana, alexia some L. scutulata at base
of plants and under Fucus,- Salinity 25‰ on damp mud.
ca. 40.47 N; 124.11 W

JR-25-78 June 17, 1978

Pacific Ocean
about 4 miles, North at Bodega Bay on State Route 1
Sonoma County
California

Littorina scutulata only on rocks

ca. 38°15 N; 123.05 W.

JR-26-78 June 17, 1978

Pacific Ocean
about 15 miles north of Sausalito and south east of
Bolinas, on inlet along State Route 1
Marin County
California

Littorina scutulata only on and under small stones and cobbles.

ca. 37.54 N; 122.42 W

JR-27-78 June 18, 1978 10:30 A.M.

West side San Francisco Bay
along U.S. Route 101, about 1 mile North of Oyster
Point and ca 2 miles south San Francisco city line.
San Mateo County
California

falling tide; Littorina scutulata on and under rocks
along water line; salinity 25‰
ca 37.41 N; 122.24 W

JR-28-78 June 18, 1978 - 5:00 P.M.

Mouth of San Francisco Bay
Fort Point, at south end Golden Gate Bridge, San Francisco
San Francisco County, California

high energy beach; Littorina scutulata from rocks,
sparse; salinity 30‰
37.48 N; 122.28 W

JR-29-78 June 19, 1978 - 8:30 A.M.

San Francisco Bay, under Bay Bridge
West side Treasure Island,
San Francisco County
California

on algae covered rocks: L. scutulata, Thais sp.; high energy
coast; mid tide, rising; on Naval Base
37.50 N; 122.22 W

JR-30-78 June 19, 1978 9:00 A.M.

San Francisco Bay, under Bay Bridge
East Side Treasure Island
San Francisco County
California

algae covered rocks (Fucus +) and under rocks; protected
side of island; Littorina scutulata under rocks and on
Fucus
37.50 N; 122.22 W

JR-31-78 June 19, 1978 - 12:00 Noon

Monterey Bay
rock jetty, south entrance harbor
Moss Landing
Monterey County
California

Littorina planaxis, First seen here, on damp.
boulders at top of tide line in spray zone;
tide falling, low at 2:30 P.M.
salinity 36 ‰
36.48 N; 121.47 W

JR-32-78 June 19, 1978 - 4:00 P.M.

Pacific Ocean
Asilomar State Beach
West at Pacific Grove
Monterey County
California

Littorina scutulata from mid to upper tide level;
Littorina planaxis in upper tide level to Spray zone
above high tide line—on granitic multitextured rock—animals
showing color and marking variations adaptive to substrate
ca. 36.38 N; 121.56 W

JR-33-78 June 20, 1978 - 1:00 P.M.
(1-3)

Pacific Ocean
on rock jetty just south of Morro Rock
Morro Bay
San Luis Obispo County
California

substation 1: - from beach side of jetty, mid and high tidal levels
" 2: - from top and outside of jetty in ocean spray zone
" 3: - from low tide line on rocks where very young, probably
recently meta morphosed Littorina (2 species) living.
about low tide - 35.22 N; 120.51 W

JR-34-78 June 20, 1978 - 4:00-5:00 P.M.

Pacific Ocean
Shell Beach, south part of town
San Luis Obispo County
California

Littorina scutulata and L. planaxis on rocks rising tide -
35.09 N; 120.40 W

JR-35-78 June 21, 1978 - 10:00 A.M.

Pacific Ocean
El Capitan Beach State Park
ca 15 miles west of Santa Barbara
Santa Barbara County
California

on rocks in spray and upper intertidal zone; nearly
high tide; Salinity 31‰
37.43 N; 119.38 W

JR-36-78 June 21, 1978 - 12:00 Noon

Pacific Ocean
South end of State Beach, Carpinteria
Santa Barbara County
California

Littorina scutulata and L. planaxis from rocky outcrop,
falling tide
34.24 N; 119.31 W

JR-37-78 June 22, 1978 - 12:00 Noon

Pacific Ocean
South of State Beach, jetty at entrance to lagoon, Carlsbad,
San Diego County
California
33.10 N; 117.21 W

JR-38-78 June 22, 1978 2:30 - 3:30 P.M.

Pacific Ocean
Ocean side, tide pool area,
Point Loma, San Diego County
California

Littorina scutulata and L. planaxis in spray zone; some
L. planaxis ca 30 feet above water on vertical cliff face,
in spray zone and in pock holes in rock
32.41 N; 117.14 W

JR-39-78 June 24, 1978 - 7:00 P.M.

Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

Route Mex 11., on shore rocks just above water Littorina
penicillata and Nerita
24.10 N; 110.18 W

JR-40-78 June 25, 1978 - 5:30 P. M.

Bahia De La Paz (south side)
about 8 miles west of La Paz
El Centenario
Baja California Sur
Mexico

Route Mex. 1, west of La Paz; pebble and sand conglomerate
shore, low tide, dead shells only, no Littorina.
ca 24.10 N; 110.18 W

JR-41-78 June 26, 1978 12:00 NOON - 1:30 P.M.

Pacific Ocean
Punto Lobos Beach, about 2.5 miles south of Todos Santos,
beyond ^{end} ~~each~~ of paved road Mex. 9.
Baja California Sur
Mexico

Littorina modesta, pullata, penicillata, and aspera in
crevices of rocky promontory at south end of beach
ca 23.27 N; 110.13 W

JR-42-78 June 26, 1978

Pacific Ocean
San Pedrito, ca 4.3 miles south of Todos Santos, beyond
end of paved road, Mex. 9.
Baja California Sur
Mexico

4 species of Littorinidae, as in JR-41-78, actively crawling
in surf; rocky headland at south end of beach; nearly high
tide-Salinity 34% in open surf; 12% in hypo saline lagoon
behind beach
ca 23.27 N; 110.13 W

JR-43-78 June 27, 1978

Bahia de Palmas, Gulf of California
Los Barriles
Baja California Sur
Mexico

large boulders scattered on sandy beach, Littorina penicillata on sunny side of rocks; Siphonaria with spiral egg masses on wave-splashed rocks-egg masses about 1" across (Kodachromes taken).
23.39 N; 109.42 W

JR-44-78 June 27, 1978 - 11:45 A.M.

Bahia San Lucas
Cabo San Lucas
Baja California Sur
Mexico

on jetty near ferry landing and next to canning factory.
4 species of Littorina on rocks and in cracks of rocks;
L. pullata in wetter situations
22.53 N; 109.54 W

JR-45-78 June 27, 1978 1:00-2:00 P.M.

Pacific Ocean, public beach between Cabo San Lucas
and San Jose Del Cabo
Baja California del Sur
Mexico

4 species of Littorina on rocks
ca 22.53 N; 109.54 W

JR-46-78 June 29, 1978 - 8:30 - 10:00 A.M.

Bahia De La Paz
Public Beach north of Pichilingue
about 11 miles North of La Paz
Baja California del Sur
Mexico

Littorina penicillata, Littorina sp., and various
other mollusks from rocks on, under and in cracks)
along rocky headland north of beach; many Nerita eggs.
Few mangroves with few L. penicillata at base of trunk.
Salinity 32-33%.
24.15 N; 110.20 W

JR-47-78 June 29, 1978 - 11:00 A.M.

Bahia De La Paz
about 2 miles south of Pichilingue
Baja California Sur
Mexico

sheltered bay with mangrove fringe;
Littorina penicillata rare on rocks
salinity 35‰
ca 24.15 N; 110.20 W

JR-48-78 June 29, 1978 - 12:00 Noon

Same locality as JR-39-78
24.10 N; 110.18 W

JR-49-78 June 29, 1978

south side Bahia De La Paz
ferry dock, end Sinaloa St.
La Paz
Baja California ~~Del~~ Sur
Mexico

Pecten Shells from fishery; Salinity 33‰
ca 24.10 N; 110.18 W

Station List - Collecting Trip
TO Washington, Oregon,
California and Baja California,
Mexico. J. Rosewater, June 1978.

JR-1-78 June 11, 1978 - 1:00 P.M.

Lincoln Park, Puget Sound

King County

Seattle, Washington

cobble beach between Point Williams +

Brace Pt.; low tide, off at 1:16 P.M. -

at Seattle - Vashon Id. ferry terminal.

ca. 47.28 N, 122.20 W

JR-2-78 June 12, 1978 - 8:00 AM

Puget Sound

Port Townsend

Jefferson County

Washington

opposite Port Townsend Motel, off State Route

20, cobble - boulder beach, area is at mouth
of Puget Sound where it flows into Strait of

Juan de Fuca water Temp. 14°C , Salinity
 27‰

48.07 N, 122.46 W

JR-3-78 June 12, 1978 - 12:30 P.M.

Strait of Juan de Fuca

Se Kiu

Clallam County

Washington

low tide 11:15 A.M.

Temp. & Water 18°C ,

Salinity 28‰ , Littorina from rocky

breakwater - on rocks and seaweed.

48.16 N, 124.18 W

JR-4-78 June 12, 1978 - 1:30 P.M.

Strait of Juan de Fuca

about 4-5 miles west of Se Kiu

Clallam County, Washington

~~low~~ ^{rising} tide, rocky beach

ca. 48.16 N, 124.19 W

JR-5-78 June 12, 1978 - 4:45 PM.

Strait of Juan de Fuca

Neah Bay

Clallam County

WASHINGTON

rocky shore^{west side of bay}, Fucus

Salinity 26‰, water temperature 18°C

48.22N; 124.37W

June 13, 1978 10:30 A.M.

JR-6-78 Mouth of Grays Harbor

Point Chehalis

Westport

GRAYS HARBOR County

Washington

rocky revetment + groin south entrance
to Grays Harbor; low tide at 12:00 Noon

ca 46.53N; 124.06W

JR-7-78 June 13, 1978 12:00 Noon - 12:30 P.M.

~~EIK River~~, south side Grays Harbor,

1/4 mile west of EIK River Bridge on state route 105

south of Westport

Grays Harbor County

Washington

Salt/Salicornia Marsh, few Alexia at bases
of plants in mud, no Littorina, water

temperature 20°C, Salinity 16‰

ca 46.48N; 124.03W

JR-8-78

June 13, 1978

12:30 PM - 1:30 PM

mouth of Elk River, south of bridge over
state route 105

Grays Harbor, south of Westport

Grays Harbor County

Washington

edge of tidal river channel; Salicornia
marsh with Fucus at margin near channel.
Littorina + eggs from on + under Fucus on
mud beneath. salinity 16‰

✓ ca 46.48 N, 124.03 W

JR-9-78

June 13, 1978

4:00 - 4:30 PM.

Willapa Bay, off State Route 101
about 6 miles NE of Ilwaco

Pacific County

Washington

✓ strong beach margin of bay Littorina
+ eggs associated with Fucus
ca 46.19 N, 124.03 W

~~List next station First~~JR-~~11~~-78

June 14, 1978

9:45 AM.

Tillamook Bay (outer - west-side)
west of Bay City + between Tillamook and
Cape Meares

Tillamook County

OREGON

rocks, muddy shore with Fucus patches
+ Salicornia, at base of jetty +
near mouth of Tillamook River.
no Littorina, salinity 1‰

ca 45.30 N; 123.53 W

↓
JR-10-78

June 14, 1978

9:00 A.M.

Pacific Ocean
Cape Meares
Tillamook County
OREGON

outer coast, high energy beach, large
cobbles; no hittorina seen; goose
barnacles, Physalia stranded on
beach.

✓
~~ca 45° 25' N~~ ca 45° 29' N, 123° 59' W.

JR-12-78

June 14, 1978

10:15 AM

Tillamook Bay - outer (west) side
west of Bay City
Tillamook County
Oregon

about 1/4 mile out on jetty from
sta. 11., rocks, boulders with Fucus -
low salinity hittorina and eggs, few
Mytilus, isopods, dead Mya. Salinity 0‰
45° 30' N; 123° 53' W.

✓
JR-13-78

June 14, 1978

12:00 Noon

Netarts Bay
Netarts

Tillamook County
OREGON

✓ just south of city; rocky fill on
shore side (inside) of bay. hittorina
scutulata on + under rocks; water
temperature 15 ~~°C~~ ^{°C}; salinity 15 ‰.
45° 26' N, 123° 57' W.

JR-14-78

June 14, 1978

2:15 P.M.

Siletz Bay

just South of Lincoln City

Lincoln County

OREGON

near mouth of Siletz Bay on rocky promontory just south of river low tide + (low tide was about 1:00 PM) *L. sitchana* + low salinity form, *L. scutellata*, banded form on and under rocks

✓ 44.59 N, 123.59 W.

JR-15-78

June 15, 1978

9:30 A.M. - 10:30 A.M.

Pacific Ocean

Sunset Bay State Park

South west of Charleston, ca. 2 miles

Coos County

Oregon

Littorina scutellata from rocks from mid-tide line to 6-8 feet above High tide Line, larger specimens higher on shore; *Fucus* + *Ulva*; *Tegula* "murex", Anemones, crabs etc in pools; salinity 25‰ (*L. sitchana* + *L. planaxis* not seen although were reported by J. Behrens to have distributional end points here).

✓ ca 43°20' ; 124°18' W

JR-16-78

June 15, 1978

11:30 - 12:15 P.M.

Pacific Ocean

✓ south cove Cape Arago State Park

ca. 5 miles southwest of Charleston

Coos County

Oregon

ca 43°20' N, 124°18' W

Littorina scutellata from rocks, abundant stranded *Rhysalia*
low tide ca. 12:30 P.M.

JR-17-78

June 15, 1978 2:30 P.M.
Pacific Ocean at
mouth of Coquille River, north jetty
Bandon
Coos County
Oregon

✓ Littorina scutulata, Thais on rocks
43.07 N, 124.25 W

JR-18-78

June 15, 1978
Pacific Ocean
1-2 miles south of Port Orford
Curry County
Oregon

✓ Littorina scutulata only on rocks; salinity 33‰
42.45 N, 124.30 W

JR-19-78

June 15, 1978
Pacific Ocean
near Lighthouse Point, Crescent City
Del Norte County
California

✓ Littorina scutulata from rocks on rising
tide Salinity 33‰
41.45 N, 124.12 W

JR-20-78

June 16, 1978 9:15 AM
Pacific Ocean
near Lagoon Creek, ca 15 miles South of
Crescent City on US ^{Route} 101.
Del Norte County
California

✓ Littorina scutulata, only, on rocks
ca 41.35 N, 124.10 W

JR-21-78

June 16, 1978

10:30 AM

Pacific Ocean

1 mile southwest of Orick

Humboldt County

California

Littorina scutulata only on large rocks
at south end of beach, on ocean side
of us route 101 across road from freshwater
lagoon.

✓

41.17N, 124.04 W.

JR-22-78

June 16, 1978

11:45 AM.

Pacific Ocean

Trinidad State Park, Trinidad

Humboldt County

California

Ocean beach, Littorina scutulata from
rocks covered with seaweed.

✓

ca 41°10'N, 124.08 W

JR-23-78

June 16, 1978

12:15 P.M.

Bay side of point

Trinidad State Park, Trinidad

Humboldt County

California

Littorina scutulata from rocks.

ca 41°10'N, 124.08 W

JR-24-78

June 16, 1978

2:45-4:15 PM

✓

west side Humboldt Bay

about 1 mile north of Samoa

Humboldt County, California

ca 40.47N,
124.11 W

along Salicornia marsh fringe + mud intertace.
Littorina newcombiana, alexia some L. scutulata at
base of plants and under Fucus - Salinity 25-30
on damp mud.

JR-25-78

June 17, 1978

Pacific Ocean

about 4 miles North of Bodega Bay
on state Route 1.

Sonoma County

California

✓ Littorina scutulata only on rocks
ca 38°15' N, 123°05' W.

JR-26-78

June 17, 1978

Pacific Ocean

about 15 miles north of Sausalito
& southeast of Bolinas, on inlet along State Route 1
Marin County

California

✓ Littorina scutulata only on and under
small stones and cobbles.

↑ ca 37.54° N, 122.42° W

JR-27-78

June 18, 1978

10:30 AM

west side San Francisco Bay

along U.S. Route 101, about 1 mile North of Oyster

Point & ca 2 miles South San Francisco city line.

San Mateo County

California

✓ falling tide; Littorina scutulata on and under
rocks along water line; salinity 25‰

↑ ca 37.41° N, 122.24° W

JR-28-78

June 18, 1978

5:00 P.M.

mouth of San Francisco Bay

✓ Fort Point, at south end Golden Gate
Bridge, San Francisco,

San Francisco County, California

high energy beach; Littorina scutulata from
rocks, sparse; salinity 30‰
37.48° N, 122.28° W

JR-29-78

June 19, 1978 8:30 AM.

San Francisco Bay, under Bay Bridge
 West Side Treasure Island,
 San Francisco County
 California

✓ on algae covered rocks: *L. scutulata*,
Thais sp.; high energy coast, mid tide,
 rising; on Naval Base.

37.50 N; 122.22 W

JR-30-78

June 19, 1978 9:00 A.M.

San Francisco Bay, under Bay Bridge
 East Side Treasure Island
 San Francisco County
 California

✓ algae covered rocks (*Fucus* +) and under
 rocks, protected side of island; *Littorina*
scutulata under rocks and on *Fucus*.

37.50 N; 122.22 W

JR-31-78

June 19, 1978 12:00 Noon

Monterey Bay
 rock jetty, south entrance harbor
 Moss Landing
 Monterey County
 California

✓ *Littorina planaxis*, First seen here, on damp.
 boulders at top of tide line in spray
 zone; tide falling, low at 2:30 P.M.
 salinity 36 ‰

36.48 N; 121.47 W.

JR-32-78

June 19, 1978

4:00 P.M.

Pacific Ocean

Asilomar State Beach

west of Pacific Grove

Monterey County

California

Littorina scutulata from mid to upper tide level,
Littorina planaxis in upper tide level to
spray zone above high tide line — on
granitic multitextured rock — animals
showing color and marking variations adaptive
to substrate.

✓ ca 36.38 N, 121.56 W

JR-33-78(1-3) June 20, 1978

1:00 P.M.

Pacific Ocean

on rock jetty just south of Morro Rock
Morro Bay

✓ San Luis Obispo County
California

Substation 1: — from beach side of jetty, mid + high tidal levels

" 2: — from top and outside of jetty in ocean
spray zone

" 3: — from low tide line on rocks where very
young, probably recently metamorphosed

✓ Littorina (2 species) living.

about low tide — 35.22 N, 120.51 W

JR-34-78

June 20, 1978

4:00 - 5:00 P.M.

Pacific Ocean

✓ Shell Beach, south part of town

San Luis Obispo County, California

Littorina scutulata and L. planaxis on rocks
rising tide — 35.09 N, 120.40 W,

JR-35-78

June 21, 1978

10:00 AM.

Pacific Ocean

El Capitan Beach State Park

ca 15 miles west of Santa Barbara

Santa Barbara County

California (37.43 N, 119.38 W.)

✓ on rocks in spray + upper intertidal zone; nearly high tide; salinity 31.700

JR-36-78

June 21, 1978

12:00 NOON

Pacific Ocean

South end of State Beach, Carpinteria

Santa Barbara County

California

Littorina scutulata + L. planaxis from rocky outcrop, falling tide.

✓ 34.24 N; 119.31 W

JR-37-78

June 22, 1978

12:00 NOON

Pacific Ocean

South of State Beach, jetty at entrance to lagoon, Carlsbad,

San Diego County

✓ California 33.10 N, 117.21 W

JR-38-78

June 22, 1978

2:30 - 3:30 P.M.

Pacific Ocean

ocean side, tide pool area,

Point Loma, San Diego County

✓ California (32.41 N, 117.14 W)

Littorina scutulata and L. planaxis in spray zone; some L. planaxis ca 30 feet above water on vertical cliff face, in spray zone and in rock holes in rock.

JR-3⁹₁-78

June 24, 1978 7:00 P.M.
Bahia De La Paz (east side)
about 4 miles north of La Paz
Baja California Sur
Mexico

Route Mex 11., on shore rocks just above
water Littorina penicillata and Nerita
24.10 N; 110.18 W.

JR-40-78

June 25, 1978 5:30 P.M.
Bahia De La Paz (south side)
about 8 miles west of La Paz
EL Centenario
Baja California Sur
Mexico

Route Mex. 1, west of La Paz; pebble and
sand conglomerate shore, low tide; dead
shells only, no Littorina.
ca 24.10 N; 110.18 W

JR-41-78

June 26, 1978 12:00 Noon - 1:30 P.M.
Pacific Ocean
Punta Lobos Beach, about 2.5 miles
south of Todos Santos, beyond end
of paved road Mex. 9.
Baja California Sur
Mexico

Littorina modesta, pullata, penicillata,
and aspera in crevices of rocks above
tide line; rocky promontory at south
end of beach.

ca 23.27 N; 110.13 W.

JR-42-78

June 26, 1978.
Pacific Ocean
San Pedrito, ca 4.3 miles south
of Todos Santos, beyond end of
paved road, Mex 9.

Baja California Sur
Mexico

4 species of Littorinidae, as in JR-41-78,
actively crawling in surf, rocky headland
at south end of beach, nearly high tide
Salinity 34 ‰ in open surf, 12 ‰ in
✓ hyposaline lagoon behind beach.
ca 23.27 N, 110.13 W.

JR-43-78

June 27, 1978
Bahia de Palmas, Gulf of California
Los Barriles
Baja California Sur
Mexico

large boulders scattered on sandy beach,
Littorina penicillata on sunny side of
rocks; Siphonaria with spiral egg
masses on wave-splashed rocks - egg
masses about 1" across (Kodachromes
taken).

✓ 23.39 N, 109.42 W

JR-44-78

June 27, 1978 11:45 A.M.

Bahia San Lucas
Cabo San Lucas
✓ Baja California Sur, Mexico

on jetty near ferry landing and next to
canning factory. 4 species of Littorina on
rocks and in cracks of rocks, L. pullata in wetter
situations. 22.53 N, 109.54 W

JR-45-78

June 27, 1978

1:00 - 2:00 PM

Pacific Ocean, public beach
between Cabo San Lucas and
San Jose Del Cabo
Baja California del Sur
Mexico

✓ 4 species of Littorina on rocks
ca 22.53N, 109.54W.

JR-46-78

June 29, 1978

8:30 - 10:00 AM

Bahia De La Paz

(P) -
Public Beach north of Pichilingue
about 11 miles North of La Paz
Baja California del Sur
Mexico

Littorina penicillata, Littorina sp., and various
other mollusk, from rocks on, under and in
cracks) along rocky headland north of beach;
many Nerita eggs. Few mangroves with few
L. penicillata at base of trunk. Salinity 32-33‰

✓ 24.15N, 110.20W

JR-47-78

June 29, 1978

11:00 AM

Bahia De La Paz

about 2 miles south of Pichilingue
Baja California Sur

Mexico

sheltered bay with mangrove fringe;
Littorina penicillata rare on rocks

✓ salinity 35‰

ca 24.15N, 110.20W

JR-48-78

June 29, 1978

12:00 Noon

Same locality as JR-39-78

24.10N, 110.18W.

✓

JR-49-78

June 29, 1978

south side Bahía De La Paz

ferry dock, end Sinaloa St.

La Paz

Bahía California Del Sur

Mexico

Pecten shells from fishing, salinity 33‰

ca. 24.10N, 110.18W

✓